



CORNELL EXTENSION BULLETIN 840

CARPENTRY

**TOOLS**  
**FOR HOMEMAKERS**

HELEN BOETTCHER  
LEOLA COOPER  
MARY PURCHASE

## CONTENTS

	PAGE
Tools for the beginner .....	3
Suggested list of tools and supplies .....	3
The workshop .....	4
Location of work area .....	4
The work surface .....	4
Tool storage and care .....	5
Storage areas .....	5
Care .....	5
Directions for the use and handling of tools and supplies .....	6
Rules and squares .....	6
Crosscut saw .....	6
Coping saw .....	7
Smoothing plane .....	9
Wood rasps and files .....	10
Corrugated fasteners .....	10
Nails .....	10
Brad awl .....	11
Hammer .....	11
Nail set .....	12
How to nail two boards together .....	13
How to draw a nail .....	13
How to tear apart an orange crate .....	14
Screws .....	14
Hand drill .....	14
Screw driver .....	15
Combination pliers .....	15
"C" Clamps .....	15
Plastic wood and wood putty .....	15
Glue .....	16
Sandpaper .....	16

Reprinted, November 1956

A publication of the  
New York State College of Home Economics,  
a unit of the State University of New York,  
at Cornell University

## Carpentry Tools For Homemakers

HELEN BOETTCHER, LEOLA COOPER, AND MARY PURCHASE

**T**HE homemaker who knows how to use carpentry tools can improve her home in many ways. She may, for example, add racks and other accessories to her storage areas for greater convenience. Step shelves, pan files, door racks, and shoe racks are fairly simple and inexpensive to make. And when they are made with care they often fit the particular space better than those that are readymade.

This bulletin has been written for women who have little experience with tools and who want to learn more about them. Some of the most commonly used tools are described and directions given for their care and use.

### Tools for the Beginner

**A**s a beginner, you do not need a complete set of carpentry tools. There are many you probably would never use. To start, buy only the tools you need to make the article planned and then add to the tool collection as the need arises. It is wise to buy tools of good quality and whenever possible to select those that you can use for more than one purpose. As your skill and interest increase, you may want to add tools for more complicated types of work.

### Suggested List of Tools and Supplies

#### Tools

- Folding rule or steel tape
- Square
- Crosscut saw, 8 point
- Coping saw and blades
- Smoothing plane
- Wood rasp with handle

Wood file, double cut, half round with handle  
File card  
Bradawl  
Hand drill with set of 1/32-inch to 1/4-inch drill points  
Claw hammer, 10 ounces or more in weight  
Nail set  
Counter sink with handle  
Screw driver  
Combination pliers  
Portable vise or "C" clamps

### **Supplies**

Assorted nails and wire brads  
Corrugated fasteners  
Assorted screws  
Furniture glue  
Wood putty or plastic wood  
Sandpaper, assorted grades  
Pencil

## **The Workshop**

### **Location of Work Area**

Your workshop may be in the basement, the attic, an unused room or any other convenient place. You might even work out-of-doors when the weather permits. If there is no suitable place for a workshop, you might be able to make a temporary set-up in the kitchen and use the kitchen table as a work bench. Wherever your work center is, it should be dry and well lighted.

### **The Work Surface**

Choose a work surface of a comfortable height for you. Unless you are relaxed and in a position to use your hands and arms freely, you may tire easily and not do your best work.

A sturdy woodworking bench with an iron screw-vise attached is a real help for home use. If you cannot have such a bench, you can use a sturdy table or a packing case and equip it with a carpenter's vise. The vise is to hold the wood for nailing, screwing, drilling, rasping, filing, sanding, and the like.

A work bench is too high for sawing anything but small boards that can be held in the vise or with clamps. For other sawing, you need a sturdy box or sawhorse low enough for you to steady the board comfortably with one knee.

## Tool Storage and Care

### Storage Areas

Tools may be stored in different ways. It is important to have the tools easy to see, reach, and handle, and stored so that cutting edges do not hit against metal. Tools may be hung on a wall, on a portable board, or in a wall cabinet that may be locked; or they may be stored in a drawer in the kitchen or utility room. You may wish to purchase or make a kit to fit your own tools (figure 1).



Figure 1. A portable tool kit

When planning the storage area, try laying the tools in different ways on a piece of paper to determine the most convenient location for each (figure 2). Trace around each tool to show where it is to be stored. This pattern will tell you the size and shape of storage area needed for your tools (figure 3).



Figure 2. Planning space requirements for tool storage

### Care

Rust and abuse are two of the greatest enemies of tools.

To prevent rust, occasionally put a few drops of light machine oil over metal surfaces and rub the oil dry before you store the tool. If the tool becomes rusty, rub it with very fine steel wool and a little kerosene. Be sure to wipe off the kerosene before you put the tool away.

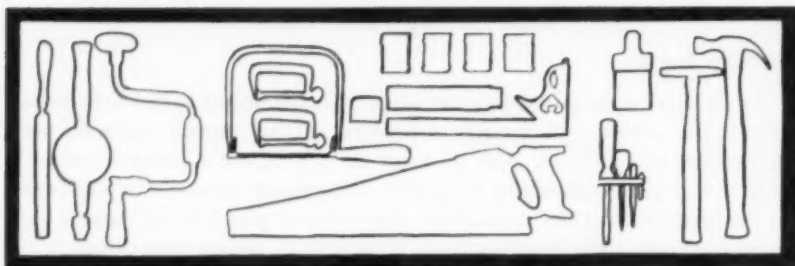


Figure 3. Paper pattern showing plan for storage

To safeguard the tool use it only for the job for which it was intended. Always keep the cutting edges sharp since dull tools are dangerous tools. Tools should be sharpened by an expert.

Tools will last almost indefinitely if they are kept clean, well oiled, and if the cutting edges are kept sharp.

## Directions for the Use and Handling of Tools

### Rules and Squares

Measuring and marking must be accurate if the job is to be well done. Any piece of wood on which you work should be squared on one side or end as described below. All measurements are made from the squared line.

The *folding rule* is good for general measuring.

The *steel tape* is flexible and handy for taking inside measurements as in cupboards.

There are several kinds of *squares*: the steel square, the try square, and the combination square. Any of these may be used for measuring or squaring wood. In addition, the combination square may be used as a miter, or as a level.

#### How to use the rule and square

1. Measure the desired length or width with the rule. Mark with a sharp pencil.
2. To square a line across the end of a board put one blade of the square along the straight side of the board and shift the square until the other blade is in the position at which the board is to be cut (figure 4).
3. Draw a line along the edge of the blade.

### Crosscut Saw

The best saw for all round use is a 24- or 26-inch crosscut saw, about 8 or 10 points to the inch. The number of points is stamped on the blade of the saw. For work in the average household the crosscut saw can be used to cut either across or with the grain of the wood.

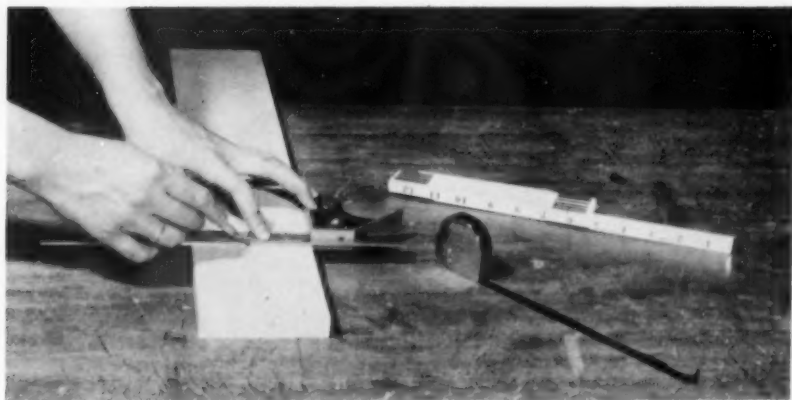


Figure 4. Measuring and squaring a board

**How to use the crosscut saw**

1. If you are using old lumber, be sure to remove nails before you begin to saw.
2. Use a square to determine the line you wish to saw. Mark with a pencil.
3. Lay the board on a sawhorse or box. Keep the line to be sawed as close as possible to the box so the board will be firm. Steady the board with the left knee and left hand. Grip the handle of the saw firmly with the right hand.
4. Hold the saw with the blade at a  $45^\circ$  angle to the wood. Use the knuckle of the left thumb as a guide for the saw (figure 5).
5. Make a few light upward strokes to start the cut. Then take long even strokes with pressure on the downward stroke. Do not force the saw.
6. As you near the end of the cut hold the free end of the board to prevent splintering (figure 6).
7. To protect the cutting edge do not lay the saw on metal objects.

**Coping Saw**

The coping saw is used for cutting curves and irregular shapes in thin wood.

**How to use the coping saw**

1. Insert the blade in the saw with the teeth slanted toward the handle.
2. Be sure that the blade is in straight. The angle of the blade on some coping saws may be adjusted. The thumb screw holds it in the desired position.
3. Clamp the board in the vise with the line to be cut as close to the jaws of the vise as possible. If a vise is not available, the board may be fastened to a table with "C" clamps to hold it firmly.



*Figure 5.* Guiding saw with thumb at start of cut



*Figure 6.* Supporting board at end of cut



4. Grasp the saw with the right hand and steady the board with the left hand (figure 7).

5. Start the cut on the pull stroke and allow the frame of the saw to follow the direction of the marked line.

6. Use the whole length of the blade when sawing because short strokes tend to heat the blade and cause it to break.



Figure 7. Cutting along a curve with coping saw

### Smoothing Plane

The smoothing plane is used on the lengthwise grain to smooth board edges and to even surfaces.

#### How to use the plane

1. It is desirable to have a vise or other device for holding the board to be planed.

2. Determine the grain of the wood. Clamp the board in a convenient position so as to plane with the grain.

3. Test the plane on a piece of scrap wood before you begin work. A well adjusted plane should take off a long, thin shaving. The cutting depth is controlled by the adjusting nut. For a deeper cut turn the nut clockwise.

4. Hold the plane in the right hand and place the left hand on the knob at the front of the plane.

5. Keep the plane straight and push it with the grain of the wood.

6. Apply pressure on the knob of the plane at the beginning of the stroke and on the handle when finishing the stroke (figure 8).

7. Test for evenness of the planed board by holding the edge of the square against it. If light shows beneath the blade of the square the board needs further planing.

8. Lay the plane on its side when not in use to avoid dulling the blade.



Figure 8. Planing the edge of a board

### Wood Rasps and Files

Rasps and files are used to finish the cross grain of wood. Rasps are much coarser than files. The amount of wood surface to be removed determines which one to use.

#### How to use the rasp or file

1. Clamp the piece or pieces of wood tightly into the vise with the edge to be filed extending just above the jaws of the vise. Two like pieces may be filed at the same time (figure 9).

2. Push the file away from you. Do not let it touch the wood on the return stroke as the cutting teeth may be dulled.

3. When filing end grain, file first from one end to the middle of the board and then from the other end to the middle to avoid splintering the wood.

4. Check the evenness of the filed board by holding a square against it. If light shows beneath the blade of the square, the board needs further filing.

5. Keep the file free from filings with a card file or stiff brush (figure 9).

6. Hang files or store them wrapped to protect the teeth when not in use.

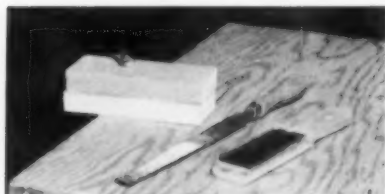


Figure 9. Two boards in position for filing end grain. Note that part of file has been cleaned with file card

### Corrugated Fasteners

Corrugated fasteners are often used to strengthen wood or to hold mitered joints together.

#### How to use the corrugated fastener

1. Center the corrugated fastener over the parts to be connected to give the most holding power (figure 10).

2. Hammer the fastener into the wood until flush with the surface.



Figure 10. Fastening two boards together with corrugated fastener

### Nails

The appropriate size and shape of the nail is determined by the wood. The nails most often used are common nails, finishing nails, and brads.

*Common nails* have large flat heads and are used for rough work. They have a great deal of holding power.

*Finishing nails* are used on finished surfaces where the heads should not be visible. The small head allows them to be driven below the surface with a nail set. The finishing nail does not hold so well as the common nail.

*Brads* are small finishing nails ranging in length from  $\frac{1}{4}$  to  $1\frac{1}{4}$  inches and are used for nailing small boards together. They vary in size from 16 to 20 gauge. Eighteen gauge is a good size for crate wood.

### **Brad Awl**

The brad awl is a small tool resembling an ice pick. It is used to punch small holes for screws and nails.

Nails that would ordinarily split a piece of wood can be driven safely after a brad awl has been used to start the hole.

#### **How to use the brad awl**

1. Use a twisting motion to the right and to the left, pushing on the handle to force the awl into the wood (figure 11).
2. Make the hole slightly smaller than the nail or screw.



*Figure 11. Making hole for nail with brad awl*

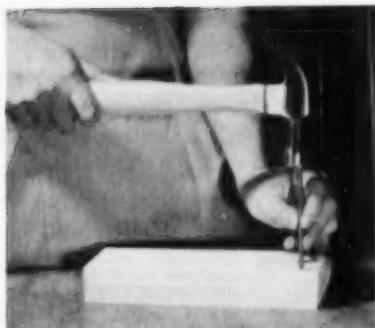
### **Hammer**

There are many types of hammers. A 10 to 14 ounce drop-forged claw hammer is suitable for driving and drawing nails.

The hammer handle should fit tightly into the hammer head. If the handle loosens, drive a wooden or metal wedge into the center of the handle where it comes through the head.

#### **How to drive a nail**

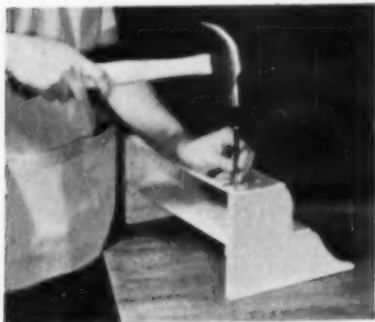
1. Grasp the hammer with the right thumb extended along the handle of the hammer. Hold the handle of the hammer parallel with the surface into which the nail is being driven and strike the nail squarely on the head to avoid bending it.
2. When driving large nails grip the hammer handle firmly at the end to give more power and to force the nail in straight (figure 12). Use short, light strokes to drive small nails.
3. Use wrist motion and let the hammer drop, thus letting gravity do the work (figure 13). It may be necessary to use arm movement to apply more force when driving a very large nail.



*Figure 12. Hammer in position to start driving a nail*



*Figure 13. Using wrist action to drive a nail*



*Figure 14. Setting a nail*

4. Finish driving the nail with light strokes so the wood surface will not be marred. On fine work use a block of wood over the nail head to avoid hammer marks on the wood.

### **Nail Set**

The nail set has a concave tip and is used to drive finishing nails below the surface of the wood.

#### **How to use the nail set**

1. Place the tip of the nail set on the nail and tap it with the hammer until the nail head is below the surface of the wood (figure 14).

2. Fill the resulting holes with wood putty or plastic wood. When the putty or plastic wood is dry, smooth the surface with sandpaper.

### How to nail two boards together

1. Choose a nail long enough so that it will go well into the second of the two boards being joined (figure 15).

2. When joining two boards of different thicknesses, nail the thin board to the thick board.

3. Lay one board on a flat surface and drive the nails well into it at evenly spaced intervals. Extend this board over the edge of the table and continue driving the nails until the points just prick through the bottom surface (figure 16).

4. Fit the two boards together carefully and finish driving the nails. For added strength, glue may be applied at the joints before the boards are fitted together.

### How to draw a nail

1. Insert the claw of the hammer under the nail head and pull the handle toward you.

2. When the handle of the hammer is nearly perpendicular to the board, place a block of wood under the head to make the nail come out easily and straight and to avoid marring the wood (figure 17).

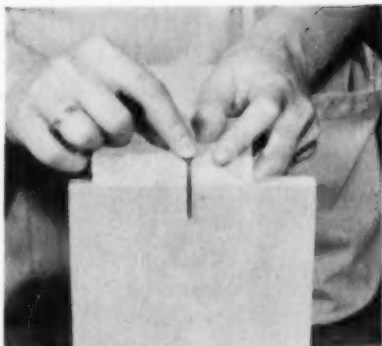


Figure 15. Showing nail length in relation to thickness of board



Figure 16. Starting nails when fastening two boards together



Figure 17. Drawing a nail



Figure 18. Tearing apart a crate

### How to tear apart a crate

1. Place a block of wood against the board which is to be removed. Hammer against the block to loosen the nails that hold the board in place. The block distributes the force of the blow and keeps the wood from splitting (figure 18).

2. After the nails have been loosened, follow the directions for drawing a nail.

### Screws

Screws have many advantages as wood fasteners. They hold better than nails and they can be

tightened easily. Screws most commonly used are the flat head and the round head types.

The *flat head screw* is countersunk and not visible on the surface.

The *round head screw* is regarded as a decorative screw as it remains visible.

### Hand Drill

The hand drill is used to bore small holes. It may be used to bore holes for screws. The drill operates on the same principle as a rotary egg beater. Instead of the paddles at the end there is a device called the chuck which holds the drill point in place. Drill points ranging from  $1/32$  to  $1/4$  inch will serve most purposes.

#### How to use the hand drill

1. Select a drill point slightly smaller than the size of the nail or screw.
2. Open the chuck of the drill and insert the drill point. Grasp the chuck and turn the wheel handle to the right until the point is firmly in place.
3. For drilling, hold the knob of the drill in the left hand and turn the handle in the right hand (figure 19).
4. To remove the drill point from the wood, continue to turn the handle to the right and pull the drill upward gradually with the left hand.

### Screw Driver

The tip of the screw driver should fit the slot of the screw. It is desirable to have several screw drivers to fit screws of different sizes.

Do not abuse the screw driver. It is designed to set screws and should not be used to pry or scrape.

#### How to set a screw

1. Make a hole in the wood with an awl or drill the depth of the threaded part of the screw. The hole should be slightly smaller than the thickness of the screw.

2. Hold the screw driver with the handle in the palm of the right hand. Guide the tip of the screw driver with the left hand.

3. Place the screw driver squarely in the groove of the head of the screw and turn it until the screw is in place. Hold the screw driver firmly in the slot to avoid burring the head of the screw.

4. If the screw does not fit in easily, apply a bit of soap on the threads. Never force the screw in place; instead remove the screw and enlarge the hole in the wood.

### Combination Pliers

A pair of 6-inch combination pliers is satisfactory for bending nails, holding screws, cutting wire and the like.

The slip joint allows a narrow or wide opening of the jaws.

### "C" Clamps

"C" clamps come in different sizes with openings from 2 to 12 inches.

They are used to hold work together, especially wood pieces that have been glued. They may also be used at times as a substitute for a vise.

### Plastic Wood

Plastic wood and wood putty are used for filling nail holes, dents, and other imperfections in the wood.

The surface should be sanded when thoroughly dry.



Figure 19. Drilling a hole for a screw



## Glue

Plastic resin powder glue is satisfactory for gluing wood. It is mixed with water, spread thinly on the surface, and allowed to dry thoroughly.

When two pieces of wood are fastened together, glue is often used to give the joint added strength. The glue should be allowed to get tacky or sticky before the boards are fastened.

With a damp cloth, remove all traces of excess glue before it hardens.



Figure 20. Tearing sandpaper



Figure 21. Sanding a board using both hands

## Sandpaper

Sandpaper is used for final smoothing of a wood surface. A coarse sandpaper, No. 1 or No.  $\frac{1}{2}$ , is usually used first; then the final sanding is done with No. 0 to No. 3/0. Sandpaper is sold in 9 x 11 inch sheets and in packages of small sheets of various degrees of fineness.

### How to use sandpaper

1. Tear the sheet into four equal parts. This can be done on the edge of a work surface (figure 20).
2. Fold a piece around a block of wood.
3. Sand with the grain of the wood.
4. Use both hands at the same time whenever possible (figure 21).

Note: Some small pieces may be sanded more easily if the sandpaper is laid on a flat surface and the wood rubbed against it.



Cooperative Extension Service, New York State College of Home Economics at Cornell University and the U. S. Department of Agriculture cooperating. In furtherance of Acts of Congress May 8, June 30, 1914. M. C. Bond, Director of Extension, Ithaca, New York.